CHAP. VIII.

ON THE SAVING OF WATER.

EVERY one acquainted with canals, muſt be ſenſible of the importance of ſaving water, and many have been the expedients reſorted to for this purpoſe; locks being frequently conſtructed of only four, or four and a half, feet riſe, in order to leſſen the conſumption of this neceſſary fluid; but ſo ſmall a riſe, on the other hand, increaſes the operations, and loſes ſome time. Canal acts have alſo various reſtrictions on boats paſſing particuar locks, unleſs the water flows over certain weirs, on particular ponds *. The following calculations will therefore exhibit the proportions of water uſed at locks, and inclined planes.

A lock for a twenty-five ton boat is, uſually, eight feet riſe, eighty feet long, ſeven feet ſix inches wide; containing one hundred and thirty-three tons of water. A loaded boat, aſcending, by preſſing its weight (*boat and cargo thirty tons*) into the lower

8×80×7·5=4800
625
9600
28800
2400
2240) 3000000 (133
2240
7600
6720
8800
6720

35·84 Cubic feet of water = 1 ton

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* Such reſtrictions may be neceſſary to ſave water; but conſidering canals on the broad ſcale of national improvement, and individual convenience, it is much the ſame, as if a cart ſhould not paſs a turnpike without a certain load. If a boat muſt exceed particular dimenſions and weight, before it can paſs ſuch lock or locks, in ſeaſons when water is ſcarce, it is evident that boats under ſuch dimenſions muſt return, and their cargoes be transferred to the larger boats belonging to the canal ſo reſtricted, or be ſent by ſome other conveyance; which, in either caſe, is an interruption of free intercourſe: on the ſmall boat principle, ſuch reſtrictions will be uſeleſs; if one boat ſtops, all muſt ſtop; wherever one can navigate, all can go; wherever canals extend, whatever may be their weights or their cargo, the uſe of water will be in proportion.

canal from the lock, will require one hundred and ſixty-three tons of water to lock to the next aſcending pond; while a loaded boat, deſcending, will preſs her weight out of the lock into the upper pond, will uſe one hundred and three tons in deſcending; hence the average is one hundred and thirty-three tons, uſed at every locking. Averaging empty boats in like manner, they will uſe alſo one hundred and thirty-three tons. To this it may be ſaid, that two boats will paſs with one lock of water; one up and one down; but this can only be the caſe when two boats fortunately meet at the ſame lock in that preciſe order; but as this can be by no means common, it is not worth taking into account; I will therefore allow to every twenty-five tons cargo, *conſidering empty and full boats*, one hundred and thirty-three tons of water, which, on a trade of five hundred tons *per* day, would amount to two thouſand ſix hundred and ſixty tons.

On the inclined plane the boats deſcending paſs without water *, as before obſerved; it is only the aſcending boats which demand water to raiſe them; and they will have the advantage of a deſcending boat, to aſſiſt in drawing them up: it may therefore be calculated that eight tons of water will raiſe four tons of cargo, four tons being allowed to enſure an ample weight for the purpoſe, to overcome friction, and for the weight of the boat itſelf; hence, if eight tons of water are uſed to an aſcending boat, and none to a deſcending boat, the average is one ton of water to one of cargo: thus, in a trade of five hundred tons *per* day, five hundred tons of water will be uſed, which is not one-fifth part of the

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* The trifle to the firſt boat, of about two tons, to raiſe her on the bridge of the plane, when one thouſand tons may paſs in rotation afterwards, may be conſidered as no object.